



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial № 10/089,702, Group № 1742,

for : Highly Resistant Aluminum-Based Alloy and Article Made from Said Alloy;

In Re Application of : Fridlyander et al.

Filed : May 22, 2002

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**DECLARATION ACCORDING TO RULE 132**

1. I, undersigned Iosif Naumovich FRIDLYANDER , citizen of the Russian Federation, am resident of Moscow.
2. I am Academician of Russian Academy of Sciences, Professor , Laureate of State Prizes; a specialist of the aviation materials science, I hold the position of the Head of Aluminum and Magnesium Alloys Division of Federal State Unitary Enterprise VIAM (All-Russian Institute of Aviation Materials) ; over forty years I have been working in the sphere of development and bringing into commercial practice the wrought aluminum alloys used in aerospace engineering.
3. I am the co-inventor of the above invention.
4. I have carried out the experiment according to US patent № 4,117,762 and said invention described in International Application PCT/RU00/00386 (WO 01/25498) and filed with US Patent Office under Ser. № 10/089,702 on May 22, 2002; and obtained the following results represented in the supplemented Schedule.

## SCHEDULE

TABLE 1

## Chemical Composition of the Compared Alloys

Chemical element	As claimed	Patent '762, Vernam
Zn	6,9	6,7
Mg	1,9	2,2
Cu	1,3	1,9
Fe	0,12	0,1
Si	0,06	0,06
Zr	0,13	0,10
Mn	0,05	0,09
Cr	0,02	0,12
Ti	0,07	0,1
Be	0,03	-
Ca	0,005	0,005
Al	base	base

## Technological and Mechanical Properties of the Alloys

Characteristics	The claimed experimental alloy		Patent '762, Vernam	
Fluidity, mm	370		250	
Ingot technological plasticity at $t_{\text{def.}}$ , %, extension/upset	135/80		90/55	
Fracture toughness $K_{IC}$ , $\text{MPa}\sqrt{\text{m}}$	45,7 (L-T) 32,3 (S-L)		34 (L-T) 22 (S-L)	
Uniformity of properties (t=150 mm)	On the surface	1/2 t	On the surface	1/2 t
$\sigma_b$ , MPa	520	500	520	460
$\sigma_{0,2}$ , MPa	455	445	460	413
$\delta$ , %	15	14	14	8

The comparative tests carried out on massive forged semiproducts (t=150 mm) and ingots 800 mm in diameter, whose chemical composition is represented in Table 1, have demonstrated that the claimed composition has substantial advantages over the alloy according to patent '762, Vernam. It is apparent from the test results represented in Table 2, that 0.03% additive of Be, combined with Ca, provides a higher melt fluidity and technological plasticity of an ingot as compared with the melt cited in patent '762, Vernam. The presence of Be in the claimed melt allows to obtain a higher fracture toughness, as well as more uniform properties within body of an article (as to thickness), which is explained by an improved hardenability of the melt owing to refining and uniform distribution of particles of the excessive primary phases.

The undersigned declarant declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be

true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both , under Section 101 of Title 18 of United States Code and that such willful false statements may jeopardize any patent issued thereon.

Date September 30. 2003

Name Iosif Naumovich Fridlyander

Iosif Naumovich FRIDLYANDER